

# Introduction to the Wye Valley – AONB

Some background facts...

Name: \_\_\_\_\_

The Wye Valley lies in what is called an AONB – Area of Outstanding Natural Beauty. It was given this classification in recognition of its

**Exceptional landscape** - dramatic limestone gorge and some of the most outstanding native woodlands to be found in Britain.

**Impressive geology** - from Silurian limestones to plateaux of Old Red Sandstone

**Historic legacies** - Silure (Iron Age) hillforts; Norman castles; the first Cistercian Abbey in Wales and a pioneering industrial heritage in iron; brass; wire; tinsplate and copper works. The valley also follows the boundary between England and Wales and the 8<sup>th</sup> Century earthworks constructed by Offa - the King of Mercia - the first man to call himself the King of England. His defensive earthworks still remain and are called Offa's Dyke - the longest archeological monument in Britain.

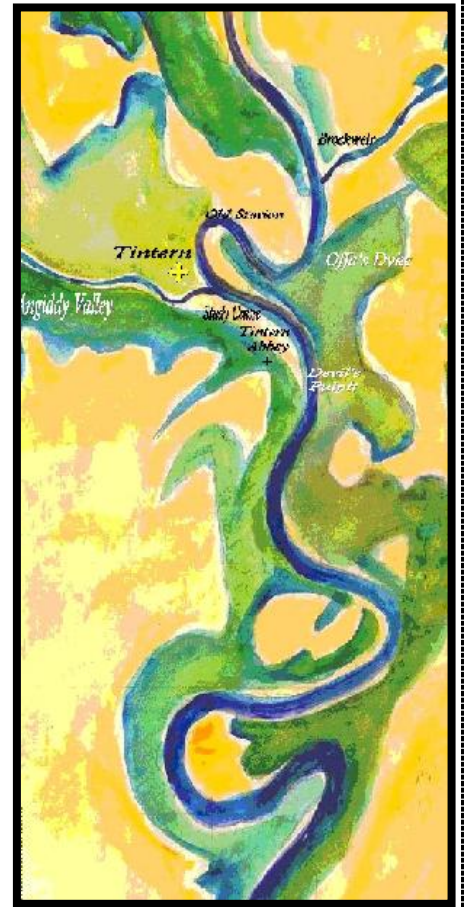
**Wildlife** - A quarter of Britain's population of lesser horseshoe bats, a growing population of peregrine falcons, goshawks, ravens, rare whitebeam, nightjar, dormice and fish like the shad and twaite all occur in the Wye Valley. In the Lower Wye Gorge and Highmeadow, woodland cover is 48%, making the Wye Valley the most wooded protected landscape in Britain. The Lower Wye Valley's high quality native woodlands, especially ash, beech and yew woods, have been identified as some of the best examples of ravine woodlands remaining throughout Europe. Designated as a Special Area of Conservation (SAC) under the European Community Habitats Directive, called Natura 2000. As such the Wye Valley is one of the most important areas for woodland conservation in the United Kingdom.

The Wye Valley is also regarded as the “**Birthplace of the Industrial Revolution**”.

Iron has been made in the Wye Valley since Roman times, using the ready supply of timber, good quality ore and abundant charcoal from the Forest of Dean. The river provided transport for the raw materials and finished product, and with the introduction of the blast furnace in the 1500s, its tributaries began to be used for waterpower. The Lower Wye Valley can claim to be the birthplace of the Industrial Revolution. The first brass made in Britain was founded at Tintern in 1566. Wire-making quickly followed, with mills situated on all the tributaries of the Lower Wye. The area resounded to the noise and smoke of heavy industry for the next 400 years and gave rise to many pioneering industries.

Historically the Wye was used for the **transportation** of goods to and from Hereford and above. In 1805 it was estimated that about 500 men were employed in hauling barges up the Wye. The wood was used to make ships, charcoal, staves and hoops for barrel-making. The Valley industries were massive consumers of timber. A ship of 150 tons, for example, required 3,000 wagonloads of timber to complete - and in 1824, 13 ships were launched at Brockweir alone. Each iron furnace required huge supplies of charcoal.

The significance of the Wye Valley's industrial history and its value as a landscape and wildlife refuge today, make it an ideal location for looking at new developments in sustainable technology. Welcome!



## The Ancient Ironworks - the Andiggy Valley

The ironworks give us an insight into how sustainable technology has been used in the past.



- 1) Why was the ironworks sited in the valley?
- 2) The iron-rich rock which is used in the iron production is called iron ore. What was added to it when it was heated in the furnace?
- 3) Why was water diverted from the Andiddy river (in a leat)?
- 4) Why does the iron production in the valley have a link with the Romans?
- 5) What is the difference between "pig iron" and wrought iron?
- 6) How is wrought iron made?
- 7) How many ironworks were there in the valley - and what types were they?
- 8) Where did the iron ore come from which was used in the ironworks?
- 9) What new work system did the ironworks introduce to Britain?
- 10) Was the manufacture of iron in the valley sustainable?

Notes:

## The Tintern-Angiddy Project

The TAP project is an innovative scheme which aims to use naturally available energy to generate electricity.

1) What technology will the TAP project use to generate electricity?

2) How long will the pipeline be?

3) The "head" of the pipeline will be 20m. What does this mean?

4) The water at the top has stored gravitational energy in it. What energy does this turn into as it falls?

5) How much electricity does the project aim to produce?

6) Have the local residents all supported the project?

7) What surveys have had to be carried out before the project starts?

8) How much carbon dioxide will the project be saving each year?

9) Why does it matter how much CO<sub>2</sub> we produce?

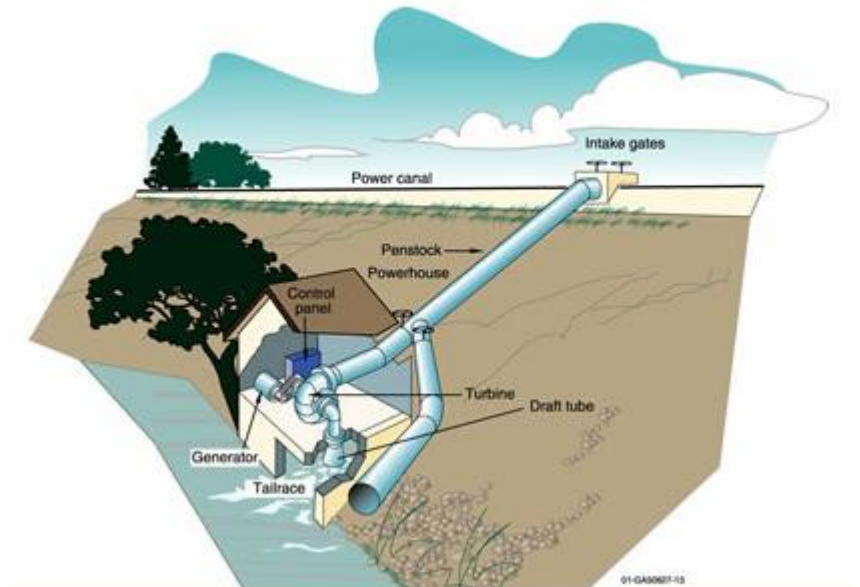
10) Why have wildlife experts had to ask important questions in the planning stages?

11) Who pays for the project?

12) Will the pipeline be visible?

13) How many years should it be able to run for?

14) Is the hydro-electric pipeline a sustainable technology?



# The Brockweir Village Eco Centre

The Brockweir Village shop provides a model for sustainable energy generation and trading for other communities in the UK. You will be looking at how this was achieved.

1) In what year was the building started on the Eco Centre?

2) What was the aim of the designers?

3) What was the first stage of the building?

4) What was the budget for the building and where did the money come from?

5) Where was the timber sourced from?

6) Where did the floor tiles come from?

7) Is there anything special about the glass in the windows?

8) What is special about the roof tiles?

9) How do they work?

10) How much electricity can they produce at maximum power?

11) What lies beneath the field outside?

12) What exactly does a heat pump do?

13) Can it produce electricity in the winter?

14) How would you describe the carbon footprint of the Eco Centre?

15) How does the way the Eco Centre trades reduce the CO<sub>2</sub> emissions of the local community?

16) What exactly is organic farming and why does it improve **biodiversity**?





# Bridge over the River Wye...



*Taken from the Sustrans website:*

"Sustrans announced today that it hopes to breathe life into the old Wye Valley Railway line by transforming it into a walking and cycling route between Chepstow, Tintern and Brockweir. The sustainable transport charity has submitted a planning application for this new path, which would pass through the Tidenham tunnel, taking walkers and cyclists approaching from the south into the spectacular Lower Wye Gorge.

As part of this plan for a walking and cycling route, a new lightweight bridge would span the Wye, replacing the lost railway bridge on the approach to Tintern Old Station Visitor Centre. This would allow local residents and visitors much better access between the villages of Brockweir and Tintern and the Visitor Centre.

Local people who want a safe means of walking or cycling between the Wye villages and Chepstow have long campaigned for this path, which would also prove accessible for people with limited mobility or in wheelchairs."

- 1) Where will the funding for the new bridge come from and how much will it cost?
- 2) What was the previous bridge over the Wye used for?
- 3) Why did it fall out of use?
- 4) When did the last train depart Tintern Old Station?
- 5) What are the special use considerations for the new bridge?
- 6) How wide will the bridge need to be?
- 7) What geological considerations are needed?
- 8) What physical features (materials chosen) of the bridge need to be considered?

**Your next challenge will be to design & build your own scale model of the bridge for consideration by the AONB planning committee.  
What style of bridge will you consider and why?**

## Sustainable technology and the future...

The government has pledged to build many new wind farms across the UK to increase current capacity by 300% by 2020. It is a drive for "sustainable technology".



Why does it matter whether or not we become sustainable as a society?

Many towns are now trying to become "transition towns". What exactly does this mean? What aspects of your school and community would **you** target for change to make our society sustainable?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

*"We do not inherit the Earth from our parents - we borrow it from our children"*  
(Old Indian proverb)

Notes...

## Tintern Abbey - Exploring the history of a sustainable community.



Tintern Abbey was once the site of a thriving community. You will be exploring the lifestyle of the people that lived here and their values.

1. When was Tintern Abbey built?

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2. Which religious community lived here?

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3. Why did the community choose this location? \_\_\_\_\_

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4. What views did the monks have about owning possessions?

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5. Describe three activities which took part in the daily life of the monks.

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

6. Do you think the lifestyle of the monks was sustainable? \_\_\_\_\_

7. Why? \_\_\_\_\_

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8. What happened to the community that lived in Tintern Abbey?

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9. When and why was the Abbey eventually abandoned to fall into ruin?

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# TINTERN ABBEY

Which of these architectural styles can you identify as you explore the Abbey?

## ARCHES

Arches are used to open walls for windows, doorways, and porticos. Before the arch was invented, a straight lintel, or beam, made of heavy stone or wood was the only way to support an opening in a wall; arches allowed for much larger openings that let in more air and light. The keystone is the large wedge-shaped stone at the top of some arches that holds the other stones in place and the voussoirs are the wedge-shaped stones surrounding the arch.



### FLAT

Flat arches are either level or have a slightly curved arch. This arch has supportive voussoirs, which are wedge-shaped stones or bricks.



### GOthic

Gothic arches, also called pointed arches, are narrow and pointed at the top. They were seen during the Gothic period in Europe from about middle 12th century to the 16th century. In the late 19th and early 20th centuries in America, a Gothic Revival style incorporated these pointed arches into homes and buildings.



### MOORISH

Moorish arches, also called Horseshoe Arches, have an exotic shape. They're most likely to be seen on commercial buildings such as theaters. A Moorish Revival style of the early 20th century in America reintroduced this arch style into the architecture scene.



### ROMAN

Roman arches are semi-circular and were first used widely by Roman engineers. Using arches and concrete, the Romans were able to build on a previously unseen scale. This rounded arch style is seen today in the Spanish Colonial architectural style and the Richardsonian Romanesque style, as well as others based on Classical Roman architecture.



### SEGMENTAL

Segmental arches have a partial curve, like an eyebrow. One of the earliest examples of a segmental arch in the West is the Ponte Vecchio Bridge in Florence, Italy, which was built in the 14th century.



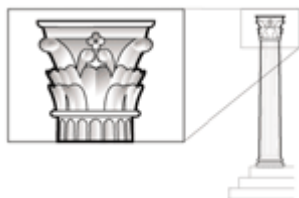
### TUDOR

Tudor arches have a low point and are seen mostly on Tudor Revival and Gothic Revival styles of architecture, both popular in the late 19th and early 20th centuries in America. These arches are based on the architecture of the English Tudor period of the 16th century.



# COLUMNS

Columns are vertical support structures for a building. Of course, they also serve a decorative purpose. A column typically has three parts: the base (the bottom), the shaft (the middle), and the capital (the top). The shaft of a column can be fluted or plain, as you'll see in the various column styles outlined here. A pilaster projects from a wall and resembles a column, but is strictly decorative and not structural.

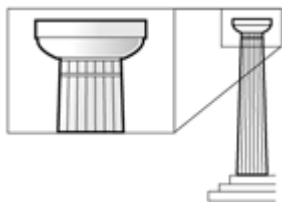


## CORINTHIAN

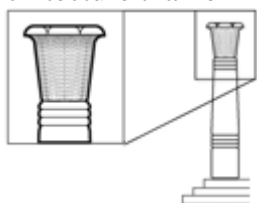
Corinthian columns have capitals with two rows of carved acanthus leaves and four spirals sprouting over the leaves. This style of column was originally Greek but used most widely by the Romans.

## DORIC

Architecture; one of originating from simple curved architecture than of Roman architecture.



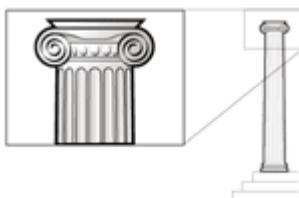
Doric columns are used in the Doric order of the three widely seen Classical orders of architecture ancient Greece. Doric columns have capitals with a molding. They were more typical of ancient Greek



## EGYPTIAN

Egyptian columns often have a lotus motif on the capital. Originally used during Ancient Egyptian times, this style re-appeared during the Egyptian Revival style seen during the late 18th and 19th centuries as well as in the Art Deco style in the early to mid 20th century. They became particularly

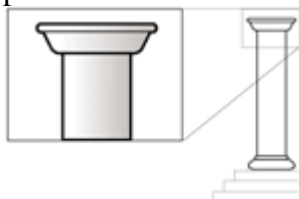
fashionable, along with all things Egyptian, in the years following Howard Carter's discovery of King Tutankhamen's tomb in 1922.



## IONIC

Ionic columns have a capital with two spirals, called volutes, and relatively slender shafts. The Ionic Order of architecture was seen during both ancient Greek and Roman civilizations though in Greek architecture the shafts are more likely to be fluted and in Roman architecture they are more likely to be

plain.



## ROMANESQUE

Romanesque columns were originally seen in the Romanesque style of architecture in Western Europe from the 9th century to 12th century.

Romanesque, also known as "Norman" in France and England, had a revival in the 1800s where the columns typical of the style, with simple curved moldings, were fashionable. The American architect Henry Hobson Richardson (1838 - 1886) put his own spin on the Romanesque style in what is called Richardsonian Romanesque; this was quite popular in the 19th century.